Abstract of the Disclosure

Systems and methods include translating a virtual memory address into a physical memory address in a multi-node system that is initiated by providing the virtual memory address at a source node. A determination is made that a translation for the virtual memory address does not exist. A physical node to query is determined based on the virtual memory address. An emulated remote translation table (ERTT) segment is queried on the determined physical node to see if the ERTT segment may provide a translation. If the translation is received then the translation may be loaded into a TLB on the source node. Otherwise a memory reference error may be generated for the entity or application referencing the invalid virtual memory address.